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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,008	12/28/2001	Sudhakar Bobba	03226.157001;P6865	7852
32615	7590	03/04/2005		
OSHA & MAY L.L.P./SUN 1221 MCKINNEY, SUITE 2800 HOUSTON, TX 77010			EXAMINER GRAYBILL, DAVID E	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/033,008

Applicant(s)

BOBBA ET AL.

Examiner

David E. Graybill

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

In the rejections infra, generally, reference labels are recited only for the first recitation of identical claim elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bui (5689139).

At column 9, line 27 to column 11, line 61, Bui discloses the following:

A bump and vias structure, comprising; a metal layer 30; a plurality of vias 32a connecting the metal layer to another metal layer 31; a bump 53 (illustrated in FIG. 5 but apparently misidentified as "43" at column 7, line 62) mounted on the metal layer; and a first slot 33 formed in the metal layer between the vias and the bump; wherein the bump is mounted on the metal layer via a landing pad 54/55; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material;

wherein the first slot comprises a current-resistant material; wherein the first slot comprises a dielectric material.

An integrated circuit, comprising; a metal layer; a plurality of vias connecting the metal layer to another metal layer; a bump mounted on the metal layer; and a first slot formed in the metal layer between the vias and the bump; wherein the bump is mounted on the metal layer via a landing pad; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current resistant material; wherein the first slot comprises a dielectric.

To further clarify, Bui discloses a bump 53 because Bui discloses a relatively abrupt protuberance 53 on a surface.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes

that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art and Bui (5689139).

In the specification at paragraphs 1-16, applicant admits as prior art all of the elements of the claims except for a first slot formed in the metal layer between the vias and the bump; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current-resistant material; wherein the first slot comprises a dielectric material.

Nonetheless, as cited supra, Bui discloses a first slot formed in the metal layer between the vias and the bump; second and third slots disposed

between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current-resistant material; wherein the first slot comprises a dielectric material. Moreover, it would have been obvious to combine this disclosure of Bui with the disclosure of applicant's admitted prior art because it would enhance the electromigration lifetime of the metal layer.

Applicant's remarks filed 12-6-4 have been fully considered and are addressed infra.

Applicant argues that Bui does not disclose a bump 53 because 53 is allegedly a plug.

This argument is respectfully traversed because the alleged disclosure of plug 53 is not mutually exclusive with the disclosure of bump 53.

Also, applicant contends that applicant's admitted prior art does not disclose "a slot formed in a metal layer between vias and a bump."

This contention is respectfully deemed unpersuasive because the admitted prior art is not necessarily relied on for this disclosure.

Application/Control Number:  
10/033,008  
Art Unit: 2822

Page 6

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**For information on the status of this application applicant should check PAIR:** Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Alternatively, applicant may contact the File Information Unit at (703) 308-2733. Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.**

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.  
The fax phone number for group 2800 is (703) 872-9306.

Application/Control Number:  
10/033,008  
Art Unit: 2822

Page 7

A handwritten signature in black ink, appearing to read "David E. Graybill".

David E. Graybill  
Primary Examiner  
Art Unit 2827

D.G.  
2-Mar-05